

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 1. (Currently Amended) A computer system, comprising:

2 a plurality of computer processor cores in which at least two of the computer processor
3 cores are heterogeneousdiffer in processing performance, and wherein the plurality of computer
4 processor coresin which all execute the same instruction set; and

5 a performance measurement and transfer mechanism configured to move~~that moves~~ a
6 plurality of executing computer processing jobs amongst the plurality of computer processor
7 cores by matching requirements of the plurality of executing computer processing jobs to
8 processing capabilities of the computer processor coresbased on a measured throughput metric.

1 2. (Currently Amended) The computer system of claim 1, further comprising:

2 at least one of an operating system hosted on the plurality of computer processor cores,
3 firmware, and special-purpose hardware that includes the performance measurement and transfer
4 mechanism, and the at least one of the operating system, firmware, and special-purpose hardware
5 is configured to provide~~that provides~~ for a periodic test to determine relative performance of
6 different jobs on different ones of the computer processor cores.

1 3-6. (Canceled)

1 7. (Currently Amended) A method for operating multiple processor cores.
2 comprising:

3 ~~placing a plurality of computer processor cores on a single semiconductor die, in which at~~
4 ~~least two computer processor cores differ in processing performance, and in which all execute~~
5 ~~the same instruction set;~~

6 obtaining a throughput metric that identifies throughput achieved by ~~a plurality of the~~
7 computer processor cores as a function of workloads running on said computer processor cores,
8 ~~wherein the plurality of computer processor cores are on a single semiconductor die, in which at~~
9 ~~least two computer processor cores differ in processing capability, and wherein the computer~~
10 ~~processor cores execute the same instruction set; and~~

11 transferring individual ones of [[said]]~~a~~ plurality of computer processing jobs amongst
12 targeted ones of said plurality of computer processor cores based on the throughput metric.

1 8. (Previously Presented) The method of claim 7, further comprising:

2 providing for a periodic test to determine relative performance of different jobs on
3 different ones of the computer processor cores.

1 9- 14 (Canceled)

1 15. (Original) The method of claim 7, further comprising:

2 associating workloads for execution on specific processor cores based on ~~annotations~~
3 ~~associated with the computer processing jobs at least one of user and application hints.~~

1 16. (Canceled)

1 17. (Previously Presented) The computer system of claim 1, further comprising at
2 least one of an operating system hosted on the plurality of computer processor cores, firmware,
3 and special-purpose hardware that includes the performance measurement and transfer
4 mechanism.

1 18. (Currently Amended) The computer system of claim 1, wherein the performance
2 measurement and transfer mechanism is configured to maximize~~maximizes~~ total system
3 throughput.

1 19. (Currently Amended) The computer system of claim 1, wherein the performance
2 measurement and transfer mechanism is configured to periodically transfer~~transfers~~ the executing
3 computer processing jobs to a new assignment amongst the plurality of computer processor
4 cores, collects~~collects~~ performance statistics about execution at the new assignment, and then
5 determines~~determines~~ whether to reassign the executing computer processing jobs to different
6 computer processor cores based on the performance statistics collected.

1 20. (Previously Presented) The computer system of claim 19, A computer system,
2 comprising:

3 a plurality of computer processor cores in which at least two differ in processing
4 performance, and wherein the plurality of computer processor cores execute the same instruction
5 set; and

6 a performance measurement and transfer mechanism configured to move a plurality of
7 executing computer processing jobs amongst the plurality of computer processor cores based on
8 a measured throughput metric,

9 wherein the performance measurement and transfer mechanism is configured to
10 swap~~swaps~~ execution of the executing computer processing jobs between the computer processor
11 cores for a period of time, monitor~~monitoring~~ resulting performance, and then builds~~builds~~ a data
12 structure~~table~~ with relative performances of jobs on different types of computer processor cores.

1 21. (Previously Presented) The computer system of claim 20, wherein the jobs are
2 reassigned based on the relative performances, by assigning jobs that benefited most from large
3 complex processor cores to said large complex processor cores.

1 22. (Previously Presented) The computer system of claim 19, wherein the
2 determination of whether to reassign the jobs to different computer processor cores also is based
3 on at least one of a user-defined metric or a workload-defined metric.

1 23. (Currently Amended) The ~~computer system~~ method of claim 7[[1]], wherein the
2 ~~measured~~ throughput metric comprises a number of instructions per second.

1 24. (Previously Presented) The computer system of claim 1, wherein movement of the
2 executing computer processing jobs is constrained to occur only at operating system time slice
3 intervals.

1 25. (Previously Presented) A method for operating multiple processor cores,
2 comprising:

3 ~~obtaining a throughput metric that identifies throughput achieved by computer processor~~
4 ~~cores on a single semiconductor die as a function of workloads running on said computer~~
5 ~~processor cores; and~~

6 assigning a plurality of computer processing jobs amongst ~~all[the]~~ plurality of computer
7 processor cores ~~based on the throughput metric~~, wherein at least two of the computer processor
8 cores differ in size or complexity but execute the same instruction set, and

9 wherein assigning the plurality of computer processing jobs amongst the plurality of
10 computer processor cores comprises matching requirements of the computer processing jobs to
11 processing capabilities of the computer processor cores based on the sizes or complexities of the
12 computer processor cores.

1 26. (Previously Presented) The method of claim 25, further comprising a step of
2 periodically testing to determine relative performance of different jobs on different ones of the
3 computer processor cores.

1 27. (Currently Amended) The method of claim 29[25], wherein the throughput
2 metric indicates total system throughput, and wherein the assigning maximizes the total system
3 throughput, as indicated by the throughput metric.

1 28. (Canceled)

1 29. (Currently Amended) ~~The method of claim 28, further comprising a step of A~~
2 ~~method for operating multiple processor cores, comprising:~~

3 ~~obtaining a throughput metric that identifies throughput achieved by computer processor~~
4 ~~cores on a single semiconductor die as a function of workloads running on said computer~~
5 ~~processor cores; and~~

6 ~~assigning a plurality of computer processing jobs amongst a plurality of computer~~
7 ~~processor cores based on the throughput metric, wherein at least two of the computer processor~~
8 ~~cores differ in size or complexity but execute the same instruction set;~~

9 ~~transferring the computer processing jobs to a new assignment amongst the plurality of~~
10 ~~computer processor cores;~~

11 ~~collecting statistics about execution performance of the computer processing jobs at the~~
12 ~~new assignment;~~

13 ~~determining whether to reassign the computer processing jobs to different computer~~
14 ~~processor cores based on the statistics collected; and~~

15 ~~building a data structure table with relative performances of the computer processing jobs~~
16 ~~on different types of computer processor cores based on the performance statistics collected.~~

1 30. (Currently Amended) The method of claim 29[28], wherein the determination of
2 whether to reassign the computer processing jobs to different computer processor cores also is
3 based on at least one of a user-defined metric or a workload-defined metric.

4 31. (Currently Amended) The method of claim 29[[25]], wherein the throughput
5 metric comprises a number of instructions performed per second.

1 32. (New) The computer system of claim 1, wherein the processing capabilities of the
2 computer processor cores are defined by one or more of chip area, available resource, and
3 relative speed of the computer processor cores.

1 33. (New) The computer system of claim 1, wherein the performance measurement
2 and transfer mechanism is configured to move the plurality of executing computer processing
3 jobs amongst the plurality of computer processor cores further based on annotations associated
4 with the computer processing jobs.

1 34. (New) The computer system of claim 1, wherein the performance measurement
2 and transfer mechanism is configured to further re-assign the plurality of executing computer
3 processing jobs amongst the plurality of computer processor cores by repeatedly performing a
4 test to match the requirements of the plurality of executing computer processing jobs to the
5 processing capabilities of the computer processor cores.

1 35. (New) The method of claim 25, wherein assigning the plurality of computer
2 processing jobs amongst the plurality of computer processor cores is further based on
3 annotations associated with the computer processing jobs.

1 36. (New) The method of claim 25, further comprising:
2 repeatedly performing a test to match requirements of the computer processing jobs to the
3 processing capabilities of the computer processor cores; and
4 re-assigning the plurality of computer processing jobs amongst the plurality of computer
5 processor cores based on the repeated tests.